

Claims:

1. A system for controlling radio parameters for use in radio communication between a base station and a mobile station, comprising:
  - a plurality of mobile stations, each of which has a position detector for detecting a current location of its own;
  - a plurality of base stations each forming a plurality of radio zones, in which a mobile station is allowed to communicate with a corresponding base station, wherein each of the base stations periodically transmits a down-link reference signal;
  - a plurality of fixed stations, which are distributed at predetermined locations in a service area composed of the plurality of radio zones, wherein each of the fixed stations receives the down-link reference signal from a corresponding base station to produce received-signal condition data of the down-link reference signal;
  - a statistical analyzer for statistically analyzing the received-signal condition data received from each of the plurality of fixed stations to store statistical condition data at each of the fixed stations in a statistical condition memory;
  - a mobile-station movement estimator for estimating a future location of the mobile station based on detected current locations of the mobile station and the predetermined locations of the fixed stations; and
  - a parameter controller for controlling radio parameters for use in radio communication between the mobile station and a base station corresponding to the future location of the mobile station based on statistical condition data at the future location of the mobile station.

2. The system according to claim 1, wherein the fixed stations, which are distributed at predetermined locations where radio-frequency propagation environment easily changes.

3. The system according to claim 1, wherein the fixed stations, which are distributed at predetermined locations where a number of mobile stations are likely to congregate.

4. The system according to claim 1, wherein the radio communication between a base station and a mobile station conforms to a code division multiple access (CDMA) scheme, wherein each of the fixed stations receives a down-link pilot channel signal from a corresponding base station to monitor a received-signal strength as condition data.

5. The system according to claim 1, wherein the statistical analyzer analyzes the received-signal condition data for each of the fixed stations according to at least one of time periods of day, days of week, months and weather conditions around respective ones of the fixed stations.

6. The system according to claim 5, wherein the weather conditions are supplied from a maintenance and operation center.

7. The system according to claim 1, wherein the fixed stations transmits the received-signal condition data to the statistical analyzer by either

wireless or wired channel.

8. A method for controlling radio parameters for use in radio communication between a base station and a mobile station in a mobile radio communication system comprising:

a plurality of mobile stations, each of which has a position detector for detecting a current location of its own;

a plurality of base stations each forming a plurality of radio zones, in which a mobile station is allowed to communicate with a corresponding base station, wherein each of the base stations periodically transmits a down-link reference signal; and

a plurality of fixed stations, which are distributed at predetermined locations in a service area composed of the plurality of radio zones, wherein each of the fixed stations receives the down-link reference signal from a corresponding base station to produce received-signal condition data of the down-link reference signal,

wherein the method comprises:

a) receiving the current location of the mobile station;

b) receiving the received-signal condition data of the down-link reference signal from each of the fixed stations;

c) statistically analyzing the received-signal condition data to store statistical condition data at each of the fixed stations in a statistical condition memory;

d) estimating a future location of the mobile station based on detected current locations of the mobile station and the predetermined locations of the fixed stations; and

e) controlling radio parameters for use in radio communication

between the mobile station and a base station corresponding to the future location of the mobile station based on statistical condition data at the future location of the mobile station.

9. The method according to claim 7, wherein the step c) comprises the step of statistically arranging the received-signal condition data according to at least one of time periods of day, days of week, months and weather conditions around respective ones of the fixed stations, wherein the statistical condition data are retrievably stored in the statistical condition memory.

10. A mobile radio communications system comprising:

- a plurality of mobile stations, each of which has a position detector for detecting a current location of its own;
- a plurality of base stations each forming a plurality of radio zones, in which a mobile station is allowed to communicate with a corresponding base station, wherein each of the base stations periodically transmits a down-link reference signal;
- a plurality of fixed stations, which are distributed at predetermined locations in a service area composed of the plurality of radio zones, wherein each of the fixed stations receives the down-link reference signal from a corresponding base station to produce received-signal condition data of the down-link reference signal; and
- a radio network control station accommodating the mobile stations, the base stations and the fixed stations, wherein the radio network control station comprises:
  - a statistical analyzer for statistically analyzing the received-signal

condition data received from each of the plurality of fixed stations to store statistical condition data at each of the fixed stations in a statistical condition memory;

a mobile-station movement estimator for estimating a future location of the mobile station based on detected current locations of the mobile station and the predetermined locations of the fixed stations; and

a parameter controller for controlling radio parameters for use in radio communication between the mobile station and a base station corresponding to the future location of the mobile station based on statistical condition data at the future location of the mobile station.

11. A program instructing a computer to control radio parameters for use in radio communication between a base station and a mobile station in a mobile radio communication system comprising:

a plurality of mobile stations, each of which has a position detector for detecting a current location of its own;

a plurality of base stations each forming a plurality of radio zones, in which a mobile station is allowed to communicate with a corresponding base station, wherein each of the base stations periodically transmits a down-link reference signal; and

a plurality of fixed stations, which are distributed at predetermined locations in a service area composed of the plurality of radio zones, wherein each of the fixed stations receives the down-link reference signal from a corresponding base station to produce received-signal condition data of the down-link reference signal,

wherein the program comprises the steps of:

a) receiving the current location of the mobile station;

b) receiving the received-signal condition data of the down-link

reference signal from each of the fixed stations;

c) statistically analyzing the received-signal condition data to store statistical condition data at each of the fixed stations in a statistical condition memory;

d) estimating a future location of the mobile station based on detected current locations of the mobile station and the predetermined locations of the fixed stations; and

e) controlling radio parameters for use in radio communication between the mobile station and a base station corresponding to the future location of the mobile station based on statistical condition data at the future location of the mobile station.